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Communication educators have long been concerned with developing pedagogical strategies for extending students' learning experiences in the basic communication course. Basic course directors have increasingly turned to speech laboratories in an attempt to address this ongoing need. This is a particularly popular approach in basic communication courses containing a public speaking component. Participation is such laboratories is expected to affect students' public speaking competency and some laboratories are specifically designed to assuage students' fear of public speaking. However, as basic course directors continue to implement speech laboratories, they often do so relying on implicit theories and personal experience rather than extant research to develop instructional strategies. Indeed, there is very little published evidence to support the pedagogical benefits of speech laboratories. Therefore, the purpose of this investigation was to document students' perceptions of the efficacy of a speech lab. Further, we examined the possibility that those who utilize the lab earn higher grades on classroom speeches compared to their peers who do not utilize the lab.

LITERATURE REVIEW

Much of the extant speech laboratory literature focuses on narrative descriptions of the purposes, development, and implementation of speech laboratories. For instance, scholars have examined considerations for instilling functional communication skills for non-native speakers (Flores, 1997), hypertext and other technological applications (Berube, 1988), as well the incorporation of communication laboratories into comprehensive retention efforts (Brownell & Watson, 1984). In a more recent essay, Hobgood (2000) described the development of a speech center designed to serve the entire university community. While these essays provide valuable design information for those interested in developing their own laboratory, they fall short of providing the kind of empirical data needed to substantiate that students perceive speech laboratories to be pedagogically beneficial or that such facilities actually help students perform better in the classroom.

The National Communication Association (NCA) recently surveyed members about the presence of communication laboratories on their campuses (Morreale, 2001). Faculty members from ten campuses provided the National Office with information about lab-based programs and described the advantages of having a lab. The results of this informal survey revealed that lab directors perceive the lab to be beneficial to undergraduate students, graduate teaching assistants (GTAs), faculty, and departments. Labs benefit undergraduate students by enhancing learning and self-confidence and de-

creasing communication anxiety. Communication labs also act as a training ground for GTAs and benefit faculty because they gain class time to work on other concepts as students can develop some skills in the lab. Finally, communication departments benefit because lab programs increase awareness on the campus of the discipline and provide assessment data for the department's review process.

The extant empirical research regarding the efficacy of speech laboratories highlights the role these facilities can play in the reduction of communication apprehension (CA) which is defined as "an individual's level of fear or anxiety associated with either real or anticipated communication with another person or persons" (McCroskey, 1977). For example, because many speech laboratories include videotaping facilities, researchers have sought to document the utility of this instructional practice in terms of reducing student apprehension (Ellis, 1995). This line of research seems compelling in light of other findings which indicate videotaping practice speeches reduces speech anxiety (Hinton & Kramer, 1998).

Beyond the practice of videotaping speeches in laboratories, scholars have documented that participation in speech laboratories can represent an efficacious option for reducing CA (McKiernan, 1984). Morreale, Ellis, and Mares-Dean (1992) found that at-risk students who participated in a speech laboratory reported significant gains in public speaking competency and an overall reduction of public speaking apprehension. Similarly, Ellis (1995) noted that students participating in a laboratory-supported public speaking course reported significant gains in competency and significant decreases

in anxiety. According to Ellis (1995), one-on-one laboratory support consisting of goal setting, video feedback, and private feedback with GTAs "provided a nonthreatening, nurturant environment that helped all students, including high apprehensives, to perceive significant increases in self-perceived competency" (p. 74). These findings are consistent with Ratliffe's (1984) research which indicates that students respond positively to the opportunity for out-of-class, individualized feedback.

Scholars in the communication discipline have not collected much data concerning the pedagogical benefits of speech labs, and consequently, lab administrators have little guidance in terms of knowing what works and what does not. The research that has been conducted has focused almost exclusively on CA and communication competency. While this research provides a foundation for the claim that speech labs work, it says little about what those who visit the lab actually think about their experience. A better understanding of students' perceptions of the lab is important to identify which aspects of lab services are most and least helpful. In other words, such an understanding should better equip lab administrators to meet the diverse needs of their students. Also, research using standardized assessment measures of CA and communication competence may not completely reflect classroom speech requirements. In addition, existing research in this area says virtually nothing about whether students who visit the lab actually receive higher grades on classroom presentations. Therefore, we asked the following research questions:

RQ1: Do students perceive the assistance they receive in the speech lab to be useful in terms of

the requirements of the speeches they deliver in the classroom?

RQ2: Do students who visit the speech lab earn higher grades on their classroom speeches compared to those that do not visit the speech lab?

METHOD

Speech Lab Design

The speech lab that we investigated was developed to provide an opportunity for students enrolled in the basic communication course[1] to practice their speeches and receive constructive feedback from trained instructors. The speech lab is overseen by a tenure-track professor who is also the Co-Director of the basic course. The lab is staffed by GTAs who teach at least one self-contained section of the course. All of the speech lab monitors receive extensive training before they begin their assignment in the lab. Initially, the GTAs are required to attend an intensive training program at the beginning of the first semester of their academic program. In addition, all GTAs are required to complete a one credit hour course that explores the pedagogical concerns of teaching the basic course (in their first semester at the university). Also, lab monitors complete a brief training program that exposes them to the expec-

[1] The basic course is a required component of the general education program and services approximately 1,500 students a semester. The focus of the course is public speaking but it also includes units on group and interpersonal communication.

tations, pedagogical goals, and operating procedures of the speech lab.

All students in the basic course receive a tour of the lab within the first two weeks of the semester. During this tour, students are informed of the appropriate and inappropriate uses of the lab. The appropriate uses of the lab include assisting those students who are high in CA through systematic visualization of successful speaking and by providing a quiet and private place for them to practice their speeches. In addition, students may utilize the lab to practice a speech (with or without taping) prior to its formal delivery in front of the class. Students also receive assistance with issues like organization and word choice as questions arise during the practice session. However, the speech lab is not available to help students prepare for exams or written assignments. In addition, students are instructed that they should not use the lab for functions that would be better served by instructors during office hours (e.g., selecting topics, proofreading an outline, constructing visual or audio aids, etc.).

The speech lab consists of one large room divided by sliding doors. Students initially enter the main office of the lab where they register and wait for assistance. The practice room is equipped with a camera, microphone, monitor, overhead projector, tape recorder, slide projector, easel, and projection screen (the sliding doors can be closed to provide privacy). The practice room is large enough to accommodate small groups of students who wish to practice their group presentation. All students who visit the lab are provided the opportunity to receive immediate oral and written feedback from lab monitors and may tape each speech for self-analysis.

Participants

Data for this study were collected from two sources: (a) students' evaluations of their lab experiences, and (b) information from students' instructors concerning lab visits and speech grades. The first group of participants consisted of 527 students who visited the speech lab at a large Midwestern university during the Spring and Summer 2000 semesters. There were more females (n = 351) than males (n = 173) in the study (3 students did not identify their sex). Despite this difference in the sex of the participants, roughly the same percentage of women (14.53%, n = 50) as men (12.14%, n = 21) reported that they visited the lab even though they were not required to do so. The average age of participants was 18.84 (SD = 2.66) and the majority of participants were in their first year of school (first year n = 461, sophomore n = 15, junior n = 37, senior n = 14). The racial and ethnic distribution of the sample was as follows: 86.1% (n = 454) Caucasian, 7.4% (n = 34) African American, 3.2% (n = 17) Asian/Pacific Islander, and 3.3% (n = 18) other.

In order to acquire data to address the second research question, the researchers collected a separate convenience sample of student speech scores from GTAs teaching the basic course in the Fall 2000 semester. The GTAs were instructed to provide the researchers with their students' scores (no information that would identify the students was included) and indicate whether they visited the speech lab prior to each of the three required course presentations. This procedure yielded scores for 435 informative, group, and persuasive

speeches. Because of the anonymous nature of data collection, the researchers were unable to acquire demographic information for the second group of participants.

Instrument

A questionnaire was developed for data collection. Beyond demographic questions, 21 items were based on the standardized form used by all basic course instructors at this university to evaluate student speeches (see Table 1). The participants were asked to rate how helpful the speech lab was in terms of the individual components (e.g., thesis statement, language use, eye contact) of the instructor evaluation form on a 1 to 5 Likert-type scale (1 = "not helpful", 5 = "very helpful"). The assessment instrument also included demographic-type questions (e.g., participant age, sex, class level) and required the participants to identify whether their visit to the lab was required by their instructor. The participants completed this assessment instrument immediately following their speech lab appointment. The alpha reliability estimate for the 21-item assessment instrument was .97.

Statistical Analyses

Simple frequency distributions were conducted for each item. This provided the researchers with information about students' motivations to visit the speech lab as well as an indication of their perceptions of the usefulness of the help they received in the speech lab. In addition, independent samples *t*-tests and MANOVA procedures were employed to explore differences be-

tween groups (those that did and did not visit the lab). The .05 level of significance was established for all statistical tests.

RESULTS

The purpose of this study was to determine whether students perceive the help they receive in the speech lab to be useful in terms of the assessment criteria used by their instructors and whether students who visit the lab earn higher grades on their classroom presentations compared to their peers who do not visit the lab.

The data indicate that most instructors require their students to visit the speech lab prior to at least one of their speeches. Specifically, 86.3% (n = 449) of the students indicated they were required to visit the lab while 13.7% (n = 71) reported their instructor did not require a visit to the lab. In addition, of the students who were required to visit the lab, 56.2% (n = 240) noted their instructor allowed them to visit the lab before any of the three major speeches. However, 27.2% (n = 116) were required to visit the lab prior to the informative speech; 7.3% (n = 31) were required to visit the lab prior to the persuasive speech; 5.9% (n = 25) were required to visit the lab prior to all of the major speeches; and 3.5% (n = 15) were required to visit the lab prior to the group presentation. When asked to identify their primary reason for visiting the lab, 43.5% (n = 229) of the students responded they were required to do so by their instructor. Other reasons for visiting the lab included an opportunity to practice the speech (26.8%, n = 141), to im-

prove public speaking skills (12%, n = 63), and to acquire help in polishing the speech (10.1%, n = 53).

Research Question 1

The first research question asked if students perceive the assistance they receive in the speech lab to be useful in terms the requirements of the speeches they deliver in the classroom. We asked students to evaluate how helpful the lab was in terms of the outline and references, introduction, body, conclusion, delivery, and overall impression. Overall, the students found the lab work useful for most trait areas. The lowest rankings were for the help students received regarding the mechanical planning decisions of the speechmaking process (e.g., purpose statement, outline format, references). The means and standard deviations for the entire assessment instrument are presented in Table 1.

We also asked whether students' perceptions of the lab varied based upon whether they visited the lab voluntarily or were required to do so by their instructor (see Table 2 for means and standard deviations). The independent samples t-tests revealed statistically significant differences between groups for the CA variable [$t(409) = -2.07$, $p < .05$]. Students who went to the lab of their own volition (M = 4.41, SD = .93, n = 59) rated the help they received from the lab regarding CA more favorably compared to students who were required to visit the lab (M = 4.12, SD = .99, n = 352). However, the groups did not differ on any of the other 20 traits and both groups rated the help they received regarding CA very favorably.

Table 1
Means and Standard Deviations for Assessment Instrument

	M	*SD*	*n*
Outline & References	11.86	2.97	292
Purpose Statement	3.97	1.10	329
Outline Format	3.91	1.14	311
References	3.26	1.88	435
Introduction	21.31	4.10	372
Attention Getter	4.24	1.00	405
Relevance Statement	4.34	.92	409
Credibility Statement	4.43	2.23	412
Thesis Statement	4.13	1.02	401
Preview of Body	4.27	.96	405
Body	20.59	4.26	325
Organization	4.16	1.04	413
Language Use	4.03	1.03	403
Transitions	4.15	1.04	406
Argument Development	4.03	1.04	351
Supporting Material	4.22	1.79	398
Conclusion			
Summary/Memorable Close	4.37	.92	404
Delivery	16.80	3.33	399
Eye Contact	4.22	1.05	422
Use of Voice	4.08	1.29	448
Use of Gestures	3.95	1.44	443
Communication Apprehension	4.16	.98	416
Overall Impression	12.83	2.49	316
Audience Analysis	4.12	1.05	382
Practice with Time Limits	4.31	.94	413
Visual Aids	4.32	1.01	350
Total	90.30	14.44	210

Table 2
Means and Standard Deviations for Assessment Instrument by Type of Visit

	Required Visit			Voluntary Visit				
	M	*SD*	*n*	*M*	*SD*	*n*	*t*	*Df*
Outline & References								
Purpose Statement	3.97	1.11	279	3.93	1.06	46	.19	323
Outline Format	3.90	1.16	264	3.93	1.07	44	-.16	306
References	3.24	1.88	372	3.34	1.89	59	-.36	429
Introduction								
Attention Getter	4.24	1.01	344	4.25	.96	56	-.10	398
Relevance Statement	4.33	.92	346	4.43	.88	58	-.78	402
Credibility Statement	4.41	2.39	352	4.48	.79	56	-.21	406
Thesis Statement	4.11	1.05	337	4.24	.86	59	-.90	394
Preview of Body	4.26	.98	343	4.32	.83	57	-.43	398
Body								
Organization	4.14	1.07	353	4.27	.83	55	-.91	406
Language Use	4.00	1.05	345	4.20	.83	54	-1.34	397
Transitions	4.12	1.06	347	4.33	.87	54	-1.44	399
Argument Development	4.06	1.05	300	3.85	.96	47	1.30	345
Supporting Material	4.27	1.89	340	3.94	.93	53	1.23	391

Table 2 (continued)

	Required Visit			Voluntary Visit				
	M	*SD*	*n*	*M*	*SD*	*n*	*t*	*Df*
Conclusion								
Summary/Memorable Close	4.37	.92	344	4.29	.98	55	.60	397
Delivery								
Eye Contact	4.19	1.06	361	4.39	.86	57	-1.30	416
Use of Voice	4.06	1.30	380	4.21	1.22	63	-.84	441
Use of Gestures	3.91	1.46	376	4.10	1.35	62	-.92	436
Communication Apprehension	4.12	.99	352	4.41	.93	59	-2.07*	409
Overall Impression								
Audience Analysis	4.10	1.07	325	4.23	.90	52	-.85	375
Practice with Time Limits	4.29	.97	353	4.42	.74	55	-.93	406
Visual Aids	4.30	1.05	297	4.42	.74	48	-.72	343

*$p<.05$.

Research Question 2

The second research question ascertained whether students who visit the speech lab earn higher grades on their classroom speeches compared to those that do not visit the lab. The descriptive data indicated that the students (data provided by the instructors) who visited the lab prior to their classroom presentations outperformed their colleagues who did not visit the lab. For example, 81.5% (n = 44) of those students who went to the lab prior to the informative speech earned a "B" (using a standard 90, 80, 70, 60 scale) or higher on the speech. In contrast, 75.4% (n = 282) of the students who did not visit the lab prior to the informative speech earned a "B" or higher. In a similar vein, 44.1% (n = 49) of students who visited the lab prior to the group presentation earned an "A" compared to only 29.8% (n = 95) of students who did not visit the lab. Finally, 61.8% (n = 42) of those that took advantage of the services offered in the lab prior to the persuasive presentation earned an "A" on that speech compared to only 34.4% (n = 121) of those who choose not to utilize the lab. A complete breakdown of the grade distributions for the speeches is presented in Table 3.

The independent samples t-tests revealed statistically significant differences for all three major presentations (see Table 4 for means and standard deviations). Specifically, students who visited the speech lab prior to the informative [$t(426) = 2.25$, $p < .05$], group [$t(428) = 4.66$, $p < .05$], and persuasive [$t(418) = 4.20$, $p < .05$] speeches obtained significantly higher scores compared

Table 3
Comparison of Speech Grades for Students Who Did and Did Not Visit the Lab

	Informative		Group		Persuasive	
	Visit	No Visit	Visit	No Visit	Visit	No Visit
A	25.9% (n = 14)	17.4% (n = 65)	44.1% (n = 49)	29.8% (n = 95)	61.8% (n = 42)	34.4% (n = 121)
B	55.6% (n = 30)	58% (n = 217)	55% (n = 61)	55.8% (n = 178)	32.3% (n = 22)	50.5% (n = 178)
C	18.5% (n = 10)	21.4% (n = 80)	.9% (n = 1)	13.5% (n = 44)	4.4% (n = 3)	13.3% (n = 47)
D		2.4% (n = 9)		.9% (n = 2)	1.5% (n = 1)	.9% (n = 3)
F		.8% (n = 3)				.9% (n = 3)

Table 4
T-Test Results for Differences in Speech Scores

	Visited the Lab			Did Not Visit the Lab				
	M	*SD*	*n*	*M*	*SD*	*n*	*t*	*Df*
Informative	85.48	5.67	54	83.21	7.10	374	2.25*	426
Group	88.64	4.68	111	85.73	5.96	319	4.66*	428
Persuasive	89.63	5.44	68	85.98	6.77	352	4.20*	418

*$p < .05$.

to those that did not visit the lab prior to the same speeches.

In order to explore whether participation in the speech lab produced immediate and/or lasting effects, a MANOVA was calculated to compare the scores of the three required speeches (informative, group and persuasive) based on students' level of participation in the lab (e.g., the number of times they went to the lab over the course of the semester). In other words, we were interested in determining if the benefits students received from visiting the speech lab extended beyond the immediate speech for which they were visiting the lab. A significant multivariate main effect was observed for the participation factor, Wilks $\lambda = .86$, $F(18, 1154.48) = 3.60$, $p < .05$, $\eta^2 = .05$. Univariate follow-up tests for the participation main effect indicated significant main effects for the group, $F(6, 410) = 7.44$, $p < .05$, $\eta^2 = .09$, and persuasive presentations, $F(6, 410) = 3.84$, $p < .05$, $\eta^2 = .05$.

In terms of the group presentation, Tukey comparisons revealed that students who visited the lab *only* prior to the group presentation ($M = 87.20$, $SD = 4.30$, $n = 82$) and students who visited the lab prior to *both* the informative and group presentations ($M = 92.90$, $SD = 2.18$, $n = 10$) earned significantly higher grades on the group presentation compared to those who never visited the lab ($M = 85.18$, $SD = 7.68$, $n = 219$). Also, students who visited the lab prior to *both* the informative and group presentations did significantly better on the group presentation compared to students who went to the lab *only* prior to the group presentation. Similarly, students who visited the lab prior to *both* the informative and group presentations earned significantly higher

grades on the group presentation than those who visited the lab *only* prior to the informative speech.

However, we were unable to find evidence of a lasting effect of participation in the speech lab. Students who visited the lab prior to the informative speech (M = 85.74, SD = 6.90, n = 39) did not earn significantly higher grades on the group presentation compared to those who never visited the lab at all.

In terms of the persuasive presentation, Tukey comparisons revealed that students who went to the lab prior to *only* the persuasive speech (M = 89.81, SD = 5.61, n = 47), students who visited the lab before *both* the informative and group presentations (M = 90.60, SD = 4.50, n = 10), and students who visited the lab before *both* the group and persuasive presentations (M = 89.75, SD = 4.48, n = 16) earned significantly higher grades on the persuasive presentation than those who never visited the lab at all (M = 85.95, SD = 6.98, n = 219). In analyses of persuasive scores, multiple visits to the lab benefit students' classroom performance. Specifically, students who visited the lab before *both* the informative and group presentations as well as those that went to the lab prior to *both* the group and persuasive presentations earned significantly higher grades on the persuasive speech than those who visited the lab *only* prior to the group presentation (M = 85.60, SD = 6.64, n = 82).

Finally, students that visited the lab prior to only the persuasive speech earned significantly higher scores than students who only went to the lab before the informative (M = 86.59, SD = 5.32, n = 39) and group speeches. In summary, students who visit the lab prior to the immediate speech being presented in the classroom reap the most benefits from participation in the

Table 5

Means and Standard Deviations for the Informative, Group, and Persuasive Presentations by Level of Participation in the Lab[2]

Participation in the Lab:	Informative		Group		Persuasive		
	M	*SD*	*M*	*SD*	*M*	*SD*	*n*
No Visits	83.55	6.73	85.18	7.68	85.95	6.98	219
Only for Informative	85.15	5.98	85.74	6.90	86.59	5.32	39
Only for Group	82.34	7.12	87.20	4.30	85.60	6.64	82
Only for Persuasive	84.19	7.23	88.09	5.70	89.81	5.61	47
Informative and Group	86.50	5.17	92.90	2.18	90.60	4.50	10
Group and Persuasive	84.06	3.68	93.81	2.20	89.75	4.80	16
Informative and Persuasive	85.75	5.32	81.00	5.48	87.00	8.33	4
Total	83.65	6.69	86.43	6.90	86.64	6.65	417

[2] Only one participant visited the lab prior to all three speeches.

lab. The means and standard deviations for all groups are reported in Table 5.

DISCUSSION

Given that speech laboratories afford students the opportunity to extend learning experiences in the basic communication course, it is important to investigate the extent to which students find this experience useful. In addition, because many communication departments are in the initial phases of developing and/or maintaining speech laboratories, they soon will be in the position to assess the pedagogical benefits of such laboratories. This study is an effort to provide statistical data to lend support to the efficacy of providing this service to speech communication students.

Research question one sought to determine the extent to which students found speech laboratory visits to be useful with regard to meeting the requirements of their speech assignments. The present study provides practical information for those seeking to develop or refine a speech lab. The results presented here highlight areas that the students in this sample perceived to be the least and most helpful services offered in the lab. The students rated all of the areas favorably but those services relating to the development, writing, and planning of speeches received the lowest rankings. The lab was perceived to be least helpful in the outline and references category. For instance, 16.9% (n = 89) of the students indicated the lab was "somewhat" or "minimally" helpful in developing a purpose statement while 30.5% (n = 95) of the students reported the lab was

"somewhat" or "minimally" helpful in providing assistance with the outline format.

By all accounts, students found the services of the speech lab to be generally useful and/or helpful in all of the required elements of the assignments. From the students' perspective, the lab was most helpful in the following areas: introduction, body, conclusion, delivery, and overall impression. For example, 58.5% (n = 241) of respondents noted the speech lab was "very helpful" in terms of creating credibility statements. Similarly, 56% (n = 409) of students responded that the lab was "very helpful" regarding the assistance with the relevance statement. Impressively, 93% (n = 370) of students noted the lab was at least "somewhat helpful" in terms of feedback regarding the summary/memorable close of their speech. Consistent with previous speech lab research (Ellis, 1995), 47.1% (n = 196) of students found the lab to be "very helpful" in the reduction of CA.

These results suggest that speech lab administrators should carefully consider the goals of the lab in relationship to the services offered. Considering the goals of the lab investigated in this study, the findings are not surprising. The lab is set up to provide opportunities for students enrolled in the basic course to practice and refine delivery of their speeches. Therefore, it makes sense that students would rate development and writing services least favorably. For those seeking to start a lab, the results of this study indicate that simply providing the opportunity to practice, videotape, and receive feedback regarding the speech has pedagogical utility. This may be the best option for programs lacking the monetary resources to develop a technology speech lab that offers additional services (e.g., computers to create vis-

ual aids or outlines) to those in the rest of the university community. Simply put, the lab does not need to assist students in every aspect of speechmaking in order to benefit students.

While this information is encouraging to speech lab attendants and basic course directors, the question still remains: Do speech lab visits make a difference in student performances? Research question two (data collected from instructors) was an attempt to address this issue. It was important to ask this follow-up question because data for research question one were collected at the conclusion of each visit but prior to actual speech performance. The results of this study suggest speech labs do make a difference in overall student performance. That is, students who attended the speech lab received higher scores on all three of the major assignments compared to students who did not attend the lab prior to their performance.

Students may reap the benefits of speech labs for various reasons. Given that students must prepare their speeches in advance of the speech lab appointment (usually scheduled at least a day or two prior to their assigned speaking date), students who attend the lab not only receive extra practice, but also feedback from lab instructors who know the criteria for evaluating speeches. It would be reasonable to assume that many students who do not attend the lab are still in the writing phases of speech preparation just prior to their speaking dates and do not allow themselves time to practice, let alone time to seek feedback from outside sources. In addition, the laboratory experience provides students the opportunity to reduce uncertainty with regard to speech requirements. This, in turn, gives stu-

dents more confidence when presenting their speech to their own classmates and instructor and increases their self-perceived competence (Ellis, 1995).

These results seem to substantiate the claim that the more students visit the lab, the better they perform on classroom presentations. The unique requirements of each of the major presentations in the basic course make it important for students to visit the lab throughout the semester to gain feedback relevant to particular tasks. Therefore, the results of this study provide speech lab directors with invaluable evidence to demonstrate the need for ongoing support for speech labs.

Although the findings of this study are of considerable importance, several limitations are notable. The first of these stems from the timing of data collection for research question one. Students completed the assessment immediately after they finished their lab session. It is possible that perceptions of the utility of the lab may differ after students actually give the speech in the classroom and receive instructor feedback. In addition, the use of two different sources of data in this study may confound the results (there may be some overlap between groups, but we do not know based on the data we collected). Specifically, the students who reported on their reactions to address the first research question may not have the same grade and visit results as the second group of students (the group we had speech scores for). Additional research using more controlled conditions will be necessary to extend the results of this study.

Additional limitations concern research question two. Initially, the design of this study prevents us from claiming that the speech lab was solely responsible for

the significant differences in speech scores we observed. We were unable to ascertain whether the students in the second group (the group we had speech scores for) who visited the lab did so because they were required to or simply because they chose to do so. This is potentially confounding because the results may reflect highly motivated students rather than the experience of visiting the lab. Again, future research efforts should seek to control for motivation.

It may be fruitful for researchers to explore sex differences in speech lab participation. In this study, several more women than men reported visiting the lab (even though the percentages of those who went voluntarily were roughly equal). Previous research suggests that women possess higher achievement motivation compared to men and are especially likely to outperform men on out-of-class assignments (Launius, 1997). Therefore, it may be that women are more likely than men to visit the lab because they are more self-motivated to do out-of-class assignments.

In addition, communication researchers should further explore students' experiences when they are required to visit the lab compared to free-choice visits. Our data indicate that both groups report very similar perceptions of the lab for all areas except CA. It may be that students who go to the lab of their own volition feel more comfortable in the lab and therefore perceive the lab to be more helpful in reducing CA. At a minimum, a better understanding of the differences between these groups (required vs. free-choice visits) would provide valuable planning information for speech lab directors.

Despite these limitations, results from both research questions are encouraging especially for those who find

themselves in the position to defend the efficacy of speech laboratories to their own institutions. Information from this study can help basic course directors justify the funds to develop their own speech labs and/or rationalize the continued financial support for maintaining a speech laboratory. While Hobgood (2000) provided basic course directors with valuable design information on how to develop speech laboratories, this study provides some empirical data needed to help substantiate the efficacy of speech laboratories. These studies used in concert should provide educational institutions the needed evidence to make arguments in support of providing this beneficial service to students.

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